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ORIGINAL ARTICLES.

A CASE OF GUMMA OF THE SCLEROTIC.

BY J. J. KYLE, MARION, IND.

Mr. S., 22 years old, consulted me on June 10 last on account of a marked inflammation and pain in the right eye. History of syphilis of 16 months standing, in fact the patient was at that time taking treatment for syphilitic abscess of glands of the neck. Upon examination I found two well marked gummata of the iris, one on the inferior pupillary margin and the other on the outer margin approximating the transverse axis.

I gave the patient proto-iodide of mercury in conjunction with iodide of potassium.

I also made a subcutaneous injection of 3 drops of a solution of hydrarg. bi-chloride, one in one thousand, into the ocular conjunctiva; not having a suitable needle, I did not continue the injection. Patient was discharged after six weeks, showing no trace of a gumma.

On October 7, patient again presented himself complaining

of pain in right eye. Upon examination I discovered a small white tumor on the sclerotic about the size of a wheat grain, situated near the superior corneal margin. The bloodvessels covering the tumor were congested. After the seventh day I first noticed a slight reduction in the size of the bloodvessels. The tumor then began to appear yellowish and necrotic.

On October 23, no trace of tumor appeared. Slight yellowish discoloration of sclerotic corresponding to the original seat of swelling.

On account of the previous history and appearance I pronounced the tumor gumma of the sclerotic and treated it accordingly, with proto-iodide of mercury and potassium iodide in large doses with the result as above.

Well marked cases of gumma are so rare and text books say so little, that I have taken the liberty of reporting this rare case.

THE PRESENT STATUS OF ASTHENOPIA.[1]

BY F. BULLER, M.D., MONTREAL.

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GENTLEMEN.—The science of medicine and the art of surgery include so wide a range of knowledge and experience that no one man can ever hope to grasp the whole subject, or to become an expert in more than a limited area of the sea of work in which he finds himself floundering so soon as the portals of our profession have opened for his admission. For this reason specialism has become more and more of a necessity, and it is through specialism, tempered by a wider knowledge, that future progress must be made. It is, therefore, well that we can all meet together, from time to time, and compare notes, so to speak. It is helpful and encouraging to learn what is being done by workers in other parts of the same field. I, myself, should feel that I had not done my duty if I did not occasionally have some contribution to offer my colleagues in medical conclave assembled. I know the subject I have chosen for to-day will interest some, perhaps more than a few of you, because asthenopia is of such frequent occurrence that every physician must time and again meet with it in some of its manifestations. The term asthenopia is, of course, generic, and includes quite a number of visual disturbances, all of which present the salient characteristic of inability to use the eyes in near work without discomfort. The asthenope is perpetually reminded that he possesses organs of vision, and many devote

[1]Read before the Canadian Medical Association at St. Johns, N. B., August 23, 1894.

a considerable portion of their time to estimating the chances of avoiding what they conceive to be an impending blindness. These gloomy forebodings are mightily strengthened by the comforting assurance of friends, and, I may add, now and again of medical advisers, that the symptoms probably indicate some serious disease of the optic nerve. The symptoms complained of vary from slight pricking or burning sensations in the eyes themselves to severe distress in or about the eyes, or to widely-extended and sometimes violent perversions of sensation, such as frequent and intense headache, pains in the back of the neck or spine, giddiness, nausea, and in some instrances attacks of vomiting, when the use of the eyes is persisted in. There is, in fact, so far as I am aware, no purely functional disease capable of causing a more genuine and persistent distress than is suffered in the severer forms of asthenopia. Taking this affection in its widest sense, I am under the impression that more than half the entire time and attention of ophthalmic surgeons is devoted to discovering the causes, and finding means for the relief of this class of patients. If I may be permitted to express another general impression, it is to the effect that asthenopia is more prevalent on the North American continent than elsewhere. I am aware, however, that general impressions are often wanting in scientific accuracy, and on closer study may prove to be erroneous. This impression is derived from two sources. First, from personal observation both in Europe and America; and, second, from the fact that the American literature of this subject during the last twenty years shows more minute attention has been given to this department of ophthalmic surgery in America than it has recived in any other country. Twenty years ago, if one may judge by the text-books of ophthalmology of that period, only two forms of asthenopia were recognized by ophthalmologists. First, accommodative asthenopia as met with in hyperopia and astigmatism; second, muscular asthenopia, such as occurs when there is insufficiency of convergence, notably in certain cases of myopia. A very brief discussion of these two forms seems to have satisfied the writers of ophthalmic treatises in

those days that they had done ample justice to the subject. I could name many European authors of much later date who seem to have advanced no further in this direction. I do not think any one can practise ophthalmology very long without discovering that there are many persons who present no appreciable error of refraction, and no fault in convergence, but are, nevertheless, tormented by difficulty in using the eyes in near work, and by other functional disturbances associated with the act of vision, and there are others in whom, when an error of refraction has been ever so carefully corrected, little or no relief from the asthenopic symptoms is obtained. These circumstances have necessarily led to a closer study of the subject, with the result that we are now able to recognize quite a number of conditions other than those already named, which give rise to asthenopic manifestations. The errors of refraction are, of course, the most frequent source of asthenopia. Hyperopia, chiefly on account of the demand that this condition makes on the mechanism of accommodation; astigmatism, the same, with the additional disturbing element of imperfect retinal images, which nature abhors not less than she does a vacuum, but which the unassisted eye is wholly unable to correct. Myopia may give rise to asthenopia also, but not so often as to the former conditions. The asthenopia of myopes is due either to disassociation of the functions of accommodation and convergence or to the increased difficulty of adequate convergence when the anteroposterior diameter of the eyeball is considerably increased, as it always is in the higher grades of axial myopia.

It is not my purpose to discuss the subject of errors of refraction and their correction; suffice to say that asthenopia associated with any considerable error of refraction, and sometimes even with comparatively trivial errors, will generally disappear when these are suitably corrected. If not, some fault in the equilibrium of the extra-ocular muscles will commonly be discovered when carefully sought for. In some instances the refractive error has of itself induced a false state of equilibrium, or rather a defective equilibrium, a perverted muscular habit, so to speak, which must be overcome before the optical

correction can be worn with comfort, and perseverance in the use of the glasses selected for several days or weeks may be necessary before complete relief is obtained. There is, however, no reason why a pair of eyes presenting considerable error of refraction, or any error of refraction, small or great, should not also have some muscular fault quite independently of the refractive error. This circumstance has evidently been everlooked by those who claim that faults of equilibrium always disappear with correction of the associated refractive error. I have observed many cases in which the most exact correction, worn for months and years, has utterly failed in this respect. That there are muscular faults capable of inducing asthenopia in emmetropic eyes is a matter of every-day experience, and it goes without saying that such cases are beyond the scope of either spherical or cylindrical glasses. From this fact we are justified in assuming that muscular faults are only susceptible of relief by correction of refraction, or defects in accommodation in so far as they happen to be directly dependent on optical defects, or some departure from the normal in the mechanism of accommodation.

It is somewhat remarkable that, although for nearly half a century no one has seemed to doubt the existence of asthenopia from the defective power of convergence or, as is commonly and loosely stated, insufficiency of the internal recti, yet it is only within the past few years that attention has been directed to faulty action on the part of the other five pairs of extra-ocular muscles, and this notwithstanding the fact, so well and so long understood, that an impairment in the functions of any one of the twelve extra-ocular muscles necessarily unbalances all the others. Now, it has been found that insufficiency of divergence is a much more common defect than that of convergence, and, when present, no less capable of inducing visual disturbance than is the latter. Faults in the vertical movements of the eyes are also by no means infrequent, and may occasion extreme distress, or asthenopia associated sometimes with widely extended reflex phenomena. Owing to the limited power of rotating the eyeballs possessed by the super-

ior and inferior recti, comparatively trivial faults in these muscles are liable to create much disturbance. Just as in the case of refractive errors, there is no constant or direct relation between the degree of error and the inconvenience it may induce. So much depends on the stability of nerve-power, occupation, state of health, and general surroundings of the individual that each one must be dealt with according to circumstances, and quite independently of hard-and-fast rules. Only this, that the conscientious ophthalmic surgeon need not hesitate to adopt whatever means of treatment seem to him the most likely to give the patient certain and permanent relief. Sometimes all that may be necessary will be change of occupation, or such treatment as will tend to invigorate or restore the general health. In other cases the use of prismatic glasses suitably adapted will suffice, but in a certain number of muscular faults permanent relief can be obtained only by surgical interference of a kind that will establish more or less completely an equilibrium of the ocular muscles. This may be extremely simple and easy of achievement, or it may be a most difficult and tedious undertaking. Under no circumstances should an operation on the extra-ocular tendons be undertaken unless the indications for its performance are clear and definite, and even then the result will largely depend on the skill and judgment of the operator. There are a few cases of asthenopia which seem to originate in undue weakness of the ciliary muscle, cases in which apart from hyperopia or presbyopia the near point of accommodation is removed beyond its proper limits, and others in which near vision may be perfect for a short time, but cannot be maintained owing to weakness of the ciliary muscle. In these the local use of eserine or pilocarpine will be of service, so also will general roborant treatment. Now and then, among elderly people, we meet with asthenopia apparently caused by loss of transparency in the refractive media, such as incipient cataract. In these it is probable that imperfect retinal images create a reflex disturbance. Reflex asthenopia of a different kind is by no means uncommon. We meet with it often in connection with nasal catarrh and nasal

deformities causing pressure of opposed mucous surfaces, surfaces which, under normal conditions, are never habitually in contact with each other. Two such conditions are to be especially noted. First, an hyperplastic or polypoid condition of the mucous membrane covering the anterior extremity of the middle turbinated; second, a spine projecting from the septum and coming in contact with the inferior turbinated. Both of these conditions require surgical interference for their relief.

Another cause of reflex asthenopia is found in the teeth. Carious teeth with ulcerated roots, especially in the upper jaw, are to be looked for, and set to rights or removed. Sometimes disease of the roots of the teeth will, for a time at least, elude discovery and make the diagnosis perplexing. So, too, disease of the antrum and perhaps of the other facial sinuses should be excluded in making a diagnosis. By far the most frequent, troublesome, and persistent reflex asthenopia is met with in young or middle-aged women who have suffered for a considerable time from uterine troubles; some of these recover from their asthenopia when cured of the uterine disease. I have already alluded to these cases at some length in a paper read before this society by Dr. Alloway at a former meeting, and will, therefore, refer you to that paper for what I might say in this connection.

There remains for consideration a considerable class of asthenopes whom we cannot place in any of the groups of cases I have mentioned. These last we can only ascribe to that ill-defined condition known as neurasthenia, but why some neurasthenics without discoverable ocular defect should be able to use their eyes with comfort and others only with difficulty, amounting perhaps to total disability, for near vision is one of the problems we have yet to solve. There are, moreover, some persistent cases of asthenopia of unknown origin which present none of the general symptoms supposed to be characteristic of neurasthenia. For these we can only hope to find a more definite place for their classification after further careful study.

I do not think we are justified in assuming that there is such a condition as asthenopia of centric origin until we can define the centric lesions upon which it is supposed to depend, or which are known to give rise to asthenopic symptoms. There may be cases traceable to known forms of dyspepsia, but I have never, to my knowledge, met with such, and I am not aware that dyspepsia, one of the commonest of all human ailments, is associated with asthenopia so often as to justify the assumed relation of cause and effect between them. It is likely that time will unravel the difficulties of diagnosis which surround the remaining sbscure cases of asthenopia, but, for my own part, I prefer an attitude of agnosticism towards all that I cannot understand rather than the easy way of concealing want of knowledge under the guise of unmeaning phraseology.

SOCIETY PROCEEDINGS.

MEETING OF THE BRITISH MEDICAL ASSOCIATION HELD AT BRISTOL, 1894.

Section of Ophthalmology.

The meetings of this Section were held in the Medical Lecture Theatre of the School. After a few introductory remarks the President, Mr. F. R. Cross called upon Mr. Simeon Snell to read his paper on "The Relations of Occupation to Eyesight," a subject on which information had been especially invited. Injury to sight from occupations involving exposure to light, heat, dust and poisonous gases was dealt with, and suggestions were made for preventing ill effects.

This was followed by a paper by Dr. Lindsay Johnson, who had made a special study of the well known failure of vision of the men employed in Salviati's Venetian Glass Works. His investigations led him to the conclusion that the partial optic atrophy to which the amblyopia was due, resulted from the furnace, and was not in any way attributable to the heart.

Mr. R. W. Doyne spoke of the influence of education on eyesight, the ill-effects of which he thought were exaggerated. He especially insisted on the harm often done by the injudicious use of blue and neutral-tint glasses.

In the discussion which followed allusion was made to various trades which are injurious to the eyes.

Mr. Ernest Clarke brought forward a resolution to the effect that it was desirable that employers of labor should be compelled to see that their men were provided with *and used*

proper precaution for preventing injury to their sight. It was however, decided that, though right in principle, the proposition was premature.

PROF. LANDOLT detailed some rules which he used for determining the affected muscle in cases of diplopia. He showed a very convenient chart, devised by himself, which indicates at a glance the affected muscle and the position of the false image.

MR. RISIEN RUSSELL gave a very clear and interesting account of a series of experiments which he had performed on monkeys with a view to determining the cortical brain-centers for eye-movements. Until he made these experiments only associated lateral movements had been obtained, or, at any rate, they had very largely predominated. He concurred with the view suggested by Dr. Hughlings Jackson that this was due to lateral movements being of first importance to the life of the animal. By means of dividing certain of the ocular muscles and thereby eliminating the possibility of lateral movements, and by using suitable stimuli, Mr. Russell had been able to discover the cortical centers for upward and downward movements of the eyes, and also for convergence.

The second meeting of the Section was commenced by Mr. Juler reading a paper on "The Diagnosis and Treatment of Catarrhal, Purulent and Granular Ophthalmia," in which he insisted on the use of the microscope in searching for gonococci and trachoma-cocci.

MR. KENNETH SCOTT advocated a 2 or 4% solution of cyanide of mercury as a treatment for trachoma more efficacious and less painful than perchloride, which is also a less stable salt than the cyanide.

DR. HERMANN KNAPP advocated "expression" which his forceps as a valuable auxiliary to other methods.

Other speakers stated that sulphate of copper was the best application. Allusion was made to the difficulty of distinguishing true trachoma by microscopic sections of the conjunctiva.

MR. JOHN GRIFFITH read a paper on "The Secretory Func-

tion of the Ciliary Body," which was illustrated by excellent drawings and microscopic sections. In one of the latter the radial musclar fibres of the iris (pupil-dilator fibres) were well shown. By means of a modification of the bleaching process introduced by Treacher Collins two years ago, Mr. Griffith was able to show much evidence that the aqueous humour is secreted by the large ciliary processes and not by the glands of the ciliary region described by Mr. Collins. These latter do not exist in albino rabbits, and therefore Mr. Griffith suggests that they control the amount of the uveal pigment.

Among the papers of the third day was one by Mr. G. E. Walker, who explained a new operation consisting of numerous punctures or incisions through the sclera-corneal junction for cases where Saemisch's section had been hitherto practised.

It was at one time feared that the International Ophthalmological Congress to be held in Edinburgh a week later than the Association meeting would render this section needless, or, at all events, uninteresting. This, however, was not the case for not only were there numerous and important papers, but the attendance was above the average, and on one occasion there ware 46 present.—*Bristol Medico-Chirurgical Journal.*

SELECTIONS.

SCOPOLAMINE.—ITS VALUE IN OPHTHALMIC PRACTICE.

BY W. HARVEY SMITH, A.M., M.D., C.M.,

House Surgeon to the Manhattan Eye and Ear Hospital.

The attention of the medical profession of this country has recently been drawn by Dr. Hasket Derby, of Boston, and Dr. Pooley, of New York, to the value scopolamine as a mydriatic. The use of this drug in America seems to have been very limited, and comparatively little information can be obtained regarding its exact properties and action and its worth compared with the standard mydriatics, atropine and homatropine.

Scopolomine is obtained from the roots of *Scopolia atropoides*, and is isomeric with atropine, hyoscine, duboisine, diaturine, and the other members of the tropeine series. By some authorities it is considered to be identical, not only in formula but in physiological action, with hyoscine, but on this point conclusive proof is lacking.

It is used in aqueous solutions, which undergo decomposition much less readily than similar solutions of atropine and homatropine.

Koebert's experiments have shown that "this substance is opposed in general physiological action to atropine; it does not stimulate the cerebral cortex like atropine, but paralyzes it."

According to Dr. Rælhmann (*Münch. med. Wochenschr.*) "scopolamine excels as a mydriatic and antiphlogistic all other tropeines in use. It is similar to hyoscine in strength of mydriatic action, without sharing its disadvantages; it has no untoward effects, does not disturb the appetite, nor does it cause,

in normal doses, dryness of the throat, nervous restlessness. reddening of the face, or frequent pulse, as in the case of atropine.

"The antiphlogistic and anodyne effect of scopolamine is not second to that of atropine, a steady diminution of the hypopyon being observed in five cases after its application. It does not affect intraocular pressure, and will therefore, in contrast to atropine, be readily borne where there is a pathological increase of the same.

"Scopolamine hydrobromate is used in one-fifth and one-tenth per cent. solutions, which are said to correspond with one-half and one per cent. atropine solutions."

In February last, Dr. D. B. St. John Roosa introduced the use of scopolamine into the Manhattan Eye and Ear Hospital in the treatment of his clinic and indoor patients, and since that time it has had a fairly general trial throughout the hospital, and its value has been pretty accurately determined in pathological and ametropic conditions, particularly the latter. Careful observations have been made in about twenty-five refraction cases, with the view of ascertaining the rapidity and thoroughness with which the accommodation can be paralyzed and the pupil dilated by scopolamine, the best method of using the drug, and the minimum strength of solution which will produce satisfactory results, physiological and toxic effects, and the duration of mydriasis and cycloplegia.

In pathological cases reliable conclusions as to the beneficial or deleterious effects of scopolamine have been difficult to arrive at, owing to the fact that it is no easy master to decide whether an abatement or an increase in the severity of an ocular disease (where only a limited number of cases can be utilized for experimentation) is due to the use of a certain drug.

The strength of the solutions employed in both pathological and refraction cases was usually one-fifth or less frequently one-tenth per cent., one or two drops being instilled into each eye until four or five instillations had been made. Maximum dilatation of the pupils was produced in all refraction cases in from ten to twenty-five minutes.

The amplitude of accommodation, as indicated by the number and distance at which Jaeger test type could be read by the patient, showed a decrease directly proportionate to the rapidity with which the pupil dilated; at the end of twenty or thirty minutes such spherical glasses were placed before the patient's eyes as would bring the near point to about twelve inches, and in nearly all the cases examined, where the perceptive functions of the eye were not at foult, the distance on each side of the point of focus at which Jaeger No. 1 could be read was from one to two inches—in other words, about the same range that we have found to be present in aphakia, and in eyes that have been fully atropinized. In the majority of patients the effect of scopolamine on the heart was manifested within from five to ten minutes by a gradual diminution in the rate of the pulse, which was lessened in three cases as much as thirty to the minutes, and was often characterized by more or less softness and compressibility. In a few cases the pulse rate was increased or became irregular in rhythm. The distant vision, which was recorded every five minutes, showed the usual diminution, the amount depending upon the variety of ametropia, the strength of the solution, and the frequency with which it was instilled. In the refraction cases toxic symptoms were induced eight times, mostly at first, as no attempt was made, by everting the puncta or pressing upon the nasal ducts, to prevent the solution from running into the nose; later on these precautions were taken, thus accounting for the infrequency of poisonous symptoms in the last fifteen cases. These symptoms resemble very closely those produced by atropine, dryness of the throat being usually the first indication of toxic effect; this came on in from fifteen minutes to an hour and lasted from four to thirty six hours. Following this was observed marked muscular weakness, with unsteady, staggering gait and great dizziness; these symptoms manifested themselves within an hour, the duration being from twelve to twenty-four hours. Loss of appetite, with considerable nausea, lasting a day, was observed in two cases. Some patients became very restless, and others, the majority, exhibited the op-

posite condition; in three cases great drowsiness came on within an hour; in one case the primary effect of the drug was exhilaration, followed in an hour by depression, the patient becoming very sleepy and heavy. The taste of the drug was often complained of and was described as being "nasty and bitter." Flushing of the face was observed only twice.

In cases of iritis, kerato-iritis, hypopyon, episcleritis, etc., where scopolamine was used, its effects were very satisfactory, but it seemed to possess no advantage over atropine. In a patient who had always been very susceptible to the influence of atropine the instillation of one drop of the one-fifth per cent. solution of scopolamine hydrobromate was sufficient to produce considerable flushing of the face. We have been unable to make any observation which would support the claims made by Ræhlmann that scopolamine will not increase tension. For purposes of examination or operation the drug has been found specially useful, owing to the rapidity of mydriatic action, one or two drops of the one-fifth or one-tenth per cent. solution being sufficient to fully dilated the pupil in from ten to twenty-five minutes. The average duration of cycloplegic and mydriatic effect we have found to be from five to eight days. Comparatively few tests with the weaker solutions have been made, but the results so far obtained from the use of a one-tenth per cent. solution have been satisfactory. In the case of a little girl with spasm of accommodation, seven instillations in sixty hours completely paralyzed the ciliary muscle, the effect lasting for six days.

In all the refraction cases examined, the results have been practically the same, so far as rapidity and thoroughness of action and duration of effect are concerned. A detailed account of two or three cases will therefore be sufficient to indicate the advantages or disadvantages which, in our experience, the drug possesses.

CASE I.—Mrs. G., aged thirty-five, examined February 25, 1894. Complains of inability to do near work for any length of time, has headache more or less constantly, and eyes have of late felt sore and tired; no external ocular disease.

V., O. D. $^{20}/_{xxx}$; $^{20}/_{xx}$ w. + 1.0 D. s. ⌒ + 1 D. cyl. ax. 90°.
V., O. S. $^{20}/_{xx}$; $^{20}/_{xx}$ w. + 1.0 D. s. ⌒ + 0.50 D. cyl. ax. 90°.
Javal, O. D. 1.5 D. ax. 90°, 180° W. R. O. S. 1 D. ax. 90°, 180° W. R.

Jaeger N. 2 at six inches.

Ophthalmoscope, O.D. $-\left|\begin{matrix}+5\\ -\end{matrix}\right. +4.$ O.S. $-\left|\begin{matrix}+4.\\ -\end{matrix}\right. +3.$

Fundi normal, refracting media clear, some spasm of ciliary muscle. Patient was tested three weeks ago under atropine, result being:

V., O. D. $^{20}/_{cc}$; $^{20}/_{xxx}$ w. + 3 D. s. ⌒ + 1.5 D. cyl. ax. 90°.
V., O. S. $^{20}/_{cc}$; $^{20}/_{xx}$ w. + 3.5 D. s. ⌒ + 0.75 D. cyl. ax. 00°.

Sol. scopolamine hydrobromate one-fifth per cent. instilled, detailed in the accompanying table.

Patient complains of a little dizziness w.+5 D., reads Jaeger No. 2 at eleven to fourteen inches.

25 min.—Ophthalmoscope + 4 D. each, spasmodic action of ciliary muscle has ceased.

Retinoscopy, O. D. $-\left|\begin{matrix}+4.\\ -\end{matrix}\right. +5.$ O.S. $-\left|\begin{matrix}+3.5.\\ -\end{matrix}\right. +4.$

30 min.—V., O. D. $^{20}/_{cc}$; $^{20}/_{xx}$ w. + 3.5 D. s. ⌒ + 1. cyl. ax. 90°.
V., O. S. $^{20}/_{cc}$; $^{20}/_{xx}$ w. + 3.5 D. s. ⌒ + 0.75 D. cyl. ax, 90°.
Reads Jaeger No. 1 from nine to eleven inches w. + 4 D. added to above correction in each eye.

35 min.—Patient complains of great dizziness, muscular weakness, dryness of the throat and headache; is unable to walk straight, and appears to be very restless.

February 21.—Patient returned to hospital to-day stating that above-mentioned symptoms lasted for twelve hours, and that, in addition, she had experienced considerable nausea and impairment of appetite.

February 22.—With same correction as on February 20, range for Jaeger No. 1 is nine to eleven inches; pupils widely

TIME	INSTILLATION.	PUPILS.	ACCOMMODATION.	VISION.
Min.				
0	Gtt.ij. in each eye.	O.D. 4.5 mm., O.S. 4.5 mm.	Jaeger No. 1 at 6 in. to 13 in.	O.D. $^{20}/_{XL}$, O.S. $^{20}/_{XX}$.
5	" "	" 5.5 " " 5.5 "	" " 1 at 8 in. to 15 in.	" $^{20}/_{XL}$, " $^{20}/_{XXX}$.
10	" "	" 5.5 " " 5.5 "	" " 1 at 14 in. to 18 in.	" $^{20}/_{L}$, " $^{20}/_{L}$.
15	" "	" 6.5 " " 6.5 "	" " 13 at 20 in.	" $^{20}/_{C}$, " $^{20}/_{C}$.
20	" "	" 7.0 " " 7.0 "	" " 13 at 20 in.	" $^{20}/_{CC}$, " $^{20}/_{CC}$.
25		" 7.0 " " 7.0 "	" " 14 at 20 in.	" $^{20}/_{CC}$, " $^{20}/_{CC}$.

TIME	INSTILLATION.	PUPILS.	ACCOMMODATION.	VISION.
Min.				
0	Gtt.ij. in each eye.	O.D. 4.0 mm., O.S. 4.0 mm.	Jaeger No. 2 at 6 inches.	O.D. $^{20}/_{XXX}$, O.S. $^{20}/_{XX}$.
5	" "	" 4.0 " " 4.0 "	" " 4 at 8 "	" $^{20}/_{L}$, " $^{20}/_{L}$.
10	" "	" 5.5 " " 6.5 "	" " 10 at 12 "	" $^{20}/_{LXX}$, " $^{20}/_{LXX}$.
15	" "	" 6.5 " " 7.0 "	" " 13 at 12 "	" $^{20}/_{C}$, " $^{20}/_{C}$.
20	" "	" 7.5 " " 7.5 "		" $^{20}/_{CC}$, " $^{20}/_{CC}$.

dilated. Toxic symptoms have subsided and patient feels perfectly well.

February 28.—Pupils four millimeters each.

O. D. w. + 3 D. s. ⌒ + 1 D. cyl. ax. 90°.

O. S. w. + 3.5 D. s. ⌒ + 0.50 D. cyl. ax. 90°.

Patient reads Jaeger No. 1 at ten inches without correction. Distant V., O. D.=$^{20}/_{L}$, O. S.=$^{20}/_{XL}$; with correction =$^{20}/_{xx}$ both.

When last seen patient was wearing the above correction constantly, and she states that the glasses have completely relieved her asthenopic symptoms.

This case demonstrates how readily toxic effects can be produced, and would disprove the statements made by the advocates of the use of scopolamine that it does not cause nervous restlessness, dryness of the throat, or disturbance of appetite.

CASE II.—John M., aged ten years, has ten degrees of alternating convergent strabismus of two years' duration.

V., O. D. $^{20}/_{XL}$; $^{20}/_{xx}$ w. + 2 D. s. ⌒ + 0.50 D. cyl. ax. 90°.

V., O. S. $^{20}/_{xx}$; $^{20}/_{xx}$ w. + 3.5 D. s. ⌒ + 0.50 D. cyl. ax. 90°.

Jaeger No. 1, six to thirteen inches.

Javal, O. D. and O. S. 1 D. ax. 90°, 180 W. R.

Ophthalmoscope, O. D. + 3 D.; O. D. + 6 D. More or less spasm of ciliary muscle renders ophthalmoscopic estimation of refraction inaccurate.

Scopolamine used as in former case, with the difference that the nasal ducts were compressed during and for a few minutes after each instillation of the drug.

With + 10 D. before each eye Jaeger No. 1 is read from six and a half to eight inches.

Ophthalmoscope, + 8 D. each. No blurring.

Retinoscopy, O. D. and O. S.— $\left|\begin{matrix} +7. \\ - \quad +7. \end{matrix}\right.$

V., O. D. $^{20}/_{CC}$; $^{20}/_{xx}$ w. + 7 D. s.

V., O. S. $^{20}/_{CC}$; $^{20}/_{xx}$ w. + 7 D. s.

Accepts no cylinder. Visual axes parallel. No toxic symptoms induced. The subsequent behavior of the ciliary muscle and iris was not determined, as patient could not return for examination.

This case illustrates the rapidity and thoroughness with which paralysis of the accommodation can be produced by scopolamine, and shows that the danger of toxic effect is reduced to a minimum by taking the precautions mentioned above.

CASE III shows in a typical manner the effect of the drug upon the pulse, which before the first instillation was 92; five minutes after the first instillation was 87; five minuter after the second, 80; five minutes after the third, 73; five minutes after the fourth, 69.

The pulse was regular throughout, but became soft and compressible within ten minutes after the drug had been used.

Had it been possible to compare the action of other mydriatics on patients upon whom the scopolamine had been tried, the deductions might have been more absolutely reliable; still, I think the observations so far made justify us in coming to the following conclusions:

1. That the toxic effect of scopolamine used in one-tenth and one-fifth per cent. solutions are easily produced, but can readily be avoided if the lids be everted or the nasal ducts compressed at the time of instillation.

2. That in diseased conditions of the eye scopolamine is quite as useful a drug as atropine.

3. That in refraction work complete and thorough paralysis of accommodation with the maximum of mydriasis can be produced in from twenty minutes to half an hour, where the drug is used *coup sur coup*, and that the duration of its effect is from five to eight days.

4. That its greatest value lies in the rapidity of its action, which renders it specially useful for purposes of examination in refraction cases and in diseased conditions of the interior of the eye.—New York *Medical Journal.*

INFLUENCE OF GENERAL MALADIES UPON THE ORGANS OF VISION.

BY PROFESSOR PANAS.

We find that a large number of patients, suffering from various maladies, develop certain visual troubles as direct consequences of their diseased condition. These phenomena are observed so constantly that ophthalmoscopic examinations of patients seem likely to become almost as necessary as auscultation or percussion. The facts are not wanting to study this important matter with benefit, and in using them I hope to be useful not only to ophthalmologists, but to those who practice in general medicine.

Retinitis hæmorrhagica is a common form of a manifestation in the eye, of diseases affecting other parts of the system. Among its characteristic lesions are a hæmorrhagic plaque situated at the inferior part of the retina a short distance from the papilla, and numerous punctiform petechiæ disseminated here and there between the large white plaques which cover the greater part of the center of the eye. The petechiæ do not always and absolutely accompany the presence of the affection, but retinal hæmorrhage very often depends upon an inflammatory lesion or retinitis. The signs are hæmorrhages, hyperæmia and œdema of the papilla, white plaques of different forms and aspects, and later the presence of pigmented spots. They are seated chiefly in the layer of the optic fibres; it is there only that the vessels are of sufficient volume to produce this kind of hæmorrhage. On close examination we see abundant radiations around a central spot, and the hæmorrhage seems to divide one of the retinal vessels. However the character of the

hæmorrhage would appear different in a more profound part, such as the internal layer; such a spot is circular, less protuberant and without peripheral radiations. A second important sign is œdema with hyperæmia of the papillæ, or papillary stasis. The optic nerve is then presented by a reddish grey spot, scarcely distinguishable from the neighboring parts. Its borders are diffuse and characterized here and there by radiations which are more apparent. At its center we find, instead of clearly defined vessels, vessels which are irregularly varicosed. The anatomical character and ophthalmoscopic aspect of these lesions give us the means of recognizing a hæmorrhage retinitis, but do not give us its origin. An important point is sometimes furnished by the seat of the lesions. As a general rule when we find an unilateral retinal apoplexy, especially at the left, and one that is limited to the posterior pole, with central scotoma, and when there is no notable trouble with the papilla, we may expect to discover a cardio-vascular affection. If the heart and the vessels are examined, lesions will be found which are characteristic of atheroma, or, it may be, of senile alterations. The manifestations of a dyscrasia are ordinarily bilateral and more diffuse. The petechiæ may be found in one eye only, but its fellow will soon be attacked. This explains why the lesions upon one eye are often more strongly marked than upon the other.

In a group of retinites from dyscrasia, those which have an albuminuric origin are by far the most frequent. It might be said that 90 cases in 100 of hæmorrhagic retinitis are from this cause. There is no relation, however, between the quantity of albumen found in the urine and the gravity of ocular lesions. This is rather to be seen in chronic interstitial nephritis. Pregnancy is a relatively frequent cause of albuminuric retinitis and the lesions often accompanying eclampsia. Ordinarily the troubles do not appear until toward the end of gestation, and they may be limited either to hæmorrhage or to papillary œdema. All of these signs may be missing; if so, we have to do with the amblyopia of pregnancy, which relieves the patient from a cerebral manifestation of the eclamptic state. In

pregnant women, amblyopia, with or without retinal lesions, does not always bear the grave prognosis which we derive from the albuminuric retinites. In a certain number of cases it is curable. One case is reported of a woman who was attacked nine times with retinitis during her pregnancies, and was at last definitely cured. The lesions are sometimes caused by scarlatina, and still more frequently by saturnism. The pigmented plaques, particularly when seated near the equator of the eye, indicate that the malady has entered into a regressive period. They are useful from a prognostic point of view.

The course of albuminuric retinitis is insidious, and may be absolutely latent. The patient feels no visual trouble in such cases, and we are often astonished in our ophthalmoscopic examinations to find the lesions so strongly marked. We should make it a rule to examine frequently the eyes of albuminaria patients. If, as is most often the case, the considerable lesions in the eye do not correspond with the troubles experienced by the patients, it also happens that the patients suffer from complete amblyopia without lesions discoverable by the ophthalmoscope. These amblyopias are not very frequent and belong to cerebral, encephalopathic and uræmic troubles, and do not bring about alterations of the retina. There is also a glycosuric retinitis which is characterized by the rapid participation in the trouble, of the optic nerve. The papilla quickly becomes atrophied, a fact demonstrated by diminution in visual acuteness and dischromatopsic affections.

If apoplectic retinitis is somewhat rare in diabetes, the same remark cannot be made of optic neuritis. This is a descending neuritis, whose point of departure is in the encephalic centres, and it ends in atrophy. The ocular manifestations of diabetes placed in their order or frequency would stand: cataract, optic neuritis, hæmorrhagic retinitis.

In the group of alterations caused by dyscrasia, oxaluric, hippuric, benzuric and polyuric retinites have been observed. Often the retinal manifestations are simple hæmorrhages, without any participation of the optic nerve in the inflammatory process. All of the affections of the liver, and particularly

those which accompany icterus, may cause either hæmorrhage or retinitis. Ocular rheumatism is one of the most important of the affections with which we have to do in pursuing our subject. At the beginning of the century, idiopathic rheumatic ophthalmia was still described as though the eye could be the seat of a primary attack of rheumatism somewhat as an articulation might be; and this protopathic manifestation was what we now recognize as acute glaucoma. Later, a large number of lesions of the eye under the name of sympathetic and symptomatic rheumatic ophthalmias included a great class of these affections. To-day the field of ocular rheumatism is much more limited, though it is still very considerable. Let us consider its most frequent seat, the iris. Rheumatic iritis occurs oftenest in individuals having, in all its degrees, the more or less apparent signs of the arthritic diathesis. This is the case whether they are shown in rheumatic antecedents of the articulations, acute or chronic, gouty manifestations, or cutaneous alterations. The classic type of this iritis is the serous form, while the plastic is more often of syphilitic origin. Serous iritis is characterized by a considerable effusion into the anterior chamber, the aqueous humor is augmented in quantity and somewhat disturbed, the eye is tense and very painful, while the inflammation and the chemosis are considerable enough to almost create a belief in a continued existence of scleritis. Iritic adhesions are only observed, in this affection, at a more advanced period. When they exist, they are always but slightly resistant. These very important characteristics are not the only ones to be observed. The cornea, in its posterior aspect, and particularly through the membrane of Descemet, partakes of the inflammation. It is serous iritis, and this type is much the most simple. When you meet with it, you may fearlessly affirm that it is a rheumatic iritis. But it is not very often that the characteristics are so well defined. In the intermediary forms, serous and plastic iritis become confounded in their symptoms. In order to decide the matter, it is necessary to be well acquainted with the etiological conditions which produce these forms. All of the manifestations

of the arthritic diathesis do not equally give rise to rheumatic iritis. It is very rare in acute poly-articular rheumatism, whilst it is frequently associated with chronic deformatory arthritis, and with what the English call "gouty rheumatism." It is not less frequent in certain cutaneous manifestations of arthritis, and in what is generally described under the generic term of uric acid diathesis. Some writers, admitting the preponderating influence of heredity, describe an iritis and an irido-cyclitis of hereditary origin. A frequent variety is seen in that which accompanies blennorrhagic rheumatism. Here we have to do with serous iritis, and it is in this form which has been described as blennorrhagic *metastatic* ophthalmia in order to show that no direct contagion should be suspected, as in purulent ophthalmia. Serous iritis is exceptional in people who are simply blennorrhagic. It is because, as I suppose, that it is not sufficient to have blennorrhagia alone in order that these complications may be produced. It is necessary that that disease have an arthritic basis. For Prof. Fournier, who admits the special blennorrhagic infection, says all of these accidents are but diverse manifestations of the same blennorrhagic virus. This being the case, we would observe ocular or articular affections much oftener in the course of a blennorrhagic discharge. Well, statistics easily demonstrate that the proportion of these cases is very small. Is this the way in which virulent maladies conduct themselves? Does not syphilis, for example, show the greater number of these cases in the regular course of such manifestations? In reality, in order that patients shall present articular or ocular accidents, it is necessary that they be rheumatic or within the power of the action of rheumatism. Blennorrhagia is but the occasion which is presented for the display of these phemonena, and it awakens the diathesis. I can cite cases in my own practice where the rheumatic manifestation did not appear until the patients had contracted blennorrhagia. Blennorrhagic iritis, like arthritic accidents of the same origin, is very rare in women. I have convinced myself that the proportion is infinitely more considerable in men. Does syphilis then comport

itself differently in the sexes? No, the reason is purely anatomical. In women we do not observe it at the neck of the bladder. In men it is the most remote part of the urethra that blennorrhagia remains longest, and if the neck of the bladder becomes involved, there are more chances for articular and ocular accidents. We observe these at a late period when the discharge is no longer contagious, whilst if we accept the hypothesis of virulence, the accidents should be likely to occur at all times. It is then in latent rheumatism that we observe the ocular accidents of blennorrhagia. A simple catheterism may be the point of departure of a hydrarthrosis of the knee as the action of cold may occasion rheumatic affections of the eye when the neck of the bladder has been attacked. In the cornea we observe a particular form of keratitis, whose relations with rheumatism in certain cases do not seem doubtful. It is the profound interstitial parenchymatous keratitis, scrofulous, vascular, or heredito-syphilitic, which I shall continue to call dyscrasic keratitis.

Is there such a thing as scleritis of a purely arthritic origin? I believe that few of these cases have been observed. Anterior sclerochoroidites and episclerites are much more frequently met with. In acting against this pathological condition we must address ourselves especially to the diathesis. Iodide of potassium or sodium and arsenic, with a season in the country have been successful in some of my cases.

Rheumatic conjunctivitis, accompanied generally by a muco-purulent secretion, may be called an eruptive form; it is a sort of eczema or pityriasis of the conjunctiva, and is tenacious and very subject to relapses. Into this class those forms of conjunctivitis, which are produced by instillations of atropia or eserine should be placed. I do not doubt that the great susceptibility of certain patients to these medicaments, and the easy production of the eruptions of blepharo-conjunctivites in them, is owing, in a great measure, to their general condition—to an arthritic predisposition. Another form is the grave, purulent and destructive conjunctivitis, which, appearing in the course of, or after the accidents of rheumatism,

and outside of all contagion, should be attributed to the arthritic diathesis. There remain the ocular paralyses of rheumatic origin. The action of cold is currently supposed to produce them, but I doubt if rheumatism has a very direct action on paralyses of the eye muscles.

From this study of the different manifestations of rheumatism or arthritis upon the organ of vision, the important fact should be retained: that it is always difficult to refer to their veritable cause the lesions that we observe. When, in particular, it is a question of rheumatism or syphilis, an error in the interpretation of the facts would be very prejudicial. We should apply ourselves to the perfect recognition of the lesions of ocular rheumatism, and, in the therapeutical portion, should not forget to combat energetically the diathesis.—*L' Union Medicale.*

ELECTRICITY IN HÆMORRHAGE INTO THE EYEBALL.[1]

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The progress in the use of electricity in therapeutics has been marvelous in the last few years. Some of the uses and effects of electricity are clearly established. There are still many opportunities open for investigation and observation.

The use of electricity in the treatment of eye diseases, especially in the treatment of opacities in the vitreous, presents a large field for investigation.

The electrical current has been employed with much success in clearing up opacities of the vitreous, and theoretical considerations as well as experience sanction its employment.[2]

Girard Lenow states as a result of his investigation in this matter that the electrical current is the most effectual and also the most rapid remedy in the treatment of opacities of the vitreous. Opacities in the vitreous may be caused by diseases of the chorioid or retina, but very often they are caused by external injury, giving rise to a hæmorrhage into the anterior or posterior chambers on into both, the blood entering from without.

The quantity of the hæmorrhage may be only small, not interfering very much with the vision. It may be profuse enough to fill both chambers with blood, and with the ophthalmoscope

[1]Read by the title before State Medical Society of Pennsylvania.

[2]Bigelow's International System of Electricity, p. 12.

you may find only a few small flocculi or striæ, or you may find only a dark surface, and not even be able to detect any reddened appearance.

This condition is generally found when the hæmorrhage occurs from without, by punctured wounds either through the cornea or through the sclerotic coat of the eyeball. Between those extremes all kinds may be present.

Prognosis.—As to results of hæmorrhage into the eyeball when it occurs from diseases of the retina or chorioid, it is governed by those diseases, or when into the anterior chamber from wounds through the cornea, the prognosis is in a measure favorable, as Leber has reported a few cases of recovery.[3]

Liebreich[4] has reported a case in a woman of forty-five years of age, who after suppression of her menses had a hæmorrhage into the eye completely shutting out the light, which in the course of time was completely absorbed and her vision fully restored. Hæmorrhages into the vitreous from the chorioid or retina are often absorbed, and the vision restored in part or completely.

But where the hæmorrhage into the vitreous is caused from external violence or from wounds in the sclerotic, the prognosis is very unfavorable. If in the anterior chamber it falls to the bottom and is absorbed.

Treatment.—Iodide of potassium, mercury, jaborandi, leeches, cupping, blisters. If due to diseased conditions of the background of the eye, if possible restore that. Galvanism so far, I think, gives the best results. As to the direction of the current, as to which pole should be placed over the affected eye, as to the quantity and length of time of a séance, the frequency of application, there is still some doubt. Some have used the positive, others the negative, some both; some from three to ten cells; others are now using a milliamperemeter, and thus are able to tell the strength they are using. Some have used

[3]Ibid.

[4]Graefe und Saemisch, vol. iv, p. 533.

faradism with some improvement. Some writers say in hæmorrhagic retinitis the galvanic current may be employed with the reasonable expectations of clearing up the hæmorrhage and of preventing its recurrance. There are a few cases on record where the hæmorrhage has been absorbed and the vision nearly or quite restored. There are also many cases where the internal as well as local treatment has not benefited the patient, with no absorption of the clot, and the vision lost.

Galvanism has, I think, given the best and promises more results than any other plan of treatment. Whether the constant current acts by the chemical decomposition of the blood in the chamber, or as a stimulant to whatever absorbents may be present, is as yet unsettled.

My plan of using the constant current has been to apply the glass eye bath filled with warm water over the affected eye, so the patient could wink and thus get the water under the lids to the conjunctiva, to which was attached the negative pole of the battery; the positive was applied by a sponge electrode to the cervical region of the spine or the temporal region.

A current of from one to five milliamperes was then passed through for from five to ten minutes at a sitting. The sittings were two or three a week. My cases are too few to make a positive statement, but enough to show, as it were, in what direction the wind blows, or as to what may be accomplished in some cases. I have only two cases to report with my results, or only two upon which the galvanic current was used, in the removal of the results of hæmorrhage.

CASE I.—William H., aged 28 years, machinist by occupation, but, owing to ill health, was doing outdoor work, and was foreman of the construction of a sewer. In September, 1892, while filling his pipe with tobacco and lighting it, after a few puffs of smoke there was an explosion. Likely it was a cap containing the fulminate of mercury, used for igniting dynamite, which he possibly had in his pocket; as he carried his tobacco loose in his pocket, it could easily happen. After the

explosion Mr. H. found he had several wounds in his face, and very soon noticed he was blind in his left eye. He was sent to me by his physician a few days after the accident. His left eye was cut through the upper lid about the middle, between the inner and outer canthus, an incision posterior to the corneo-sclerotic junction, of three-eighths of an inch in length, followed by extensive hæmorrhage from the wound into the posterior chamber.

The eye, so far as external appearance was concerned, was normal. The pupil was very sluggish in response to light. Tension slightly increased.

With a strong light reflected into his eye, not a glimmer of light could be seen by him. The ophthalmoscope revealed only a dark surface. The anterior chamber normal in depth and free from hæmorrhage. After treating him for over four months with potassium iodide, jaborandi, mercury, blisters and general tonics, without any result—after getting advice from some of the best men in the country, who told me the case was evidently hopeless—I proposed the treatment with galvanism as possibly a chance. After using it three times a week for two weeks he thought the cloud was getting thinner. After four weeks of treatment he could perceive light from darkness, and soon thereafter a small part of the red reflex from the retina could be detected from the inner part of the eye with the ophthalmoscope. At the end of two months he could see light, and the spot of reflex from the retina was increasing.

His internal treatment was continued as before. At six months the retina could be seen dimly all over the posterior part of the eye; the fibers or striæ well marked, with vision improving so as soon to be able to recognize small objects; counts fingers when in close proximity. In a year's time his vision was $^{10}/_{xx}$—, with the striæ still present. While he does not have working vision, he has still useful vision left with the injured eye.

CASE II.—H. S., aged 42 years. Hæmorrhagic retinitis, possibly caused by diabetes.

In June, 1890, had the first attack of hæmorrhage, following some exertion. A few moments following he noticed he could not perceive light with one eye. The ophthalmoscope revealed a very faint reflex, but under general treatment it was partly absorbed in three months. Just at this time he had an attack in the other eye, which was almost as bad as the first. The second eye cleared up fairly well, vision improved in both eyes, but the hæmorrhages recurred in both eyes during the year. As one eye would improve, the other would get worse. After a year's treatment, directed to the diabetes and the general health, I gave him galvanism once a week to both eyes. In a short time both eyes had cleared to vision $^{15}/_{xx}$, when, in a few months, another hæmorrhage occurred in the first eye, again completely shutting out all light. The galvanic current was continued only once a week, as he lived quite a distance from the city. In two months the vision had markedly improved, and has contined to hold at least its own. There has heen no hæmorrhage now in either eye for over a year. His vision, $^{20}/_{xxx}$. Earlier the slightest exertion would bring on a hæmorrhage; now he can do light work on the farm; and, as there has been no recurrence of the hæmorrhage, with his vision possibly still improving, there has been marked improvement in the condition of the blood-vessels, as well as in the absorption of the hæmorrhage.

Galvanism, then, in these cases has at least been quite an addition in their treatment, and much of the benefit is due to its use.